

CLAIMS

What is claimed is:

- 1 1. A conformal coating noise suppressor for canceling interfering signals traveling over
2 a conductor of a printed circuit board comprising:
3 the conductor; and
4 a conductive coating of a conformal electromagnetic interference (EMI) shield
5 conformingly adhered to surfaces of the printed circuit board,
6 wherein a portion of the conductive coating proximate to the conductor is configured
7 such that the conductive coating and conductor form a first receiver loop in which signals
8 induced therein travel through the conductor in a direction that is opposite the direction in
9 which the interfering signals travel.
- 1 2. The noise suppressor of claim 1, wherein the conductor is part of a second receiver
2 loop in which the interfering signals are induced.
- 1 3. The noise suppressor of claim 2, wherein the canceling and interfering signals are
2 induced in response to magnetic or electromagnetic coupling of an external field with the
3 first and second receiver loops, respectively.
- 1 4. The noise suppressor of claim 1, wherein the conductor comprises a surface trace that
2 is connected to an interconnect post mounted on the printed circuit board.
- 1 5. The noise suppressor of claim 2, wherein the second receiver loop comprises:
2 the conductor;
3 an electrical filter circuit coupled to the conductor;
4 a ground plane of the printed circuit board connected to the electrical filter through a
5 ground land and an integral ground via; and
6 the interconnect post,
7 wherein the electrical filter decouples conducted interfering signals from transmitted
8 signals received at the interconnect post.

1 6. The noise suppressor of claim 5, wherein the electrical filter circuit comprises one or
2 more lumped, distributed or dissipative elements, wherein the electrical filter has a
3 frequency characteristic suitable for decoupling the conducted interfering signal from the
4 transmitted signal.

1 7. A decoupling circuit on a printed circuit board, comprising:
2 an electrical filter circuit, electrically connected between an interconnect post and a
3 ground land coupled to a ground plane, the filter configured to shunt conducted
4 interfering signals received over the interconnect post to the ground plane, wherein
5 components of the electrical filter circuit form a first receiver loop in which interfering
6 signals can be induced; and
7 a second receiver loop comprising a conductive coating of an electromagnetic
8 interference (EMI) shield conformingly adhered to surfaces of the decoupling circuit, and
9 a conductive path of the first receiver loop,
10 wherein the second receiver loop is adapted to have induced therein a signal having a
11 direction and magnitude sufficient to cancel interfering signals induced in the first
12 receiver loop.

1 8. The decoupling circuit of claim 7, wherein the conductive coating is conformally
2 secured to exterior surfaces of the electrical filter and insulated from the electrical filter,
3 interconnect post and surface traces, and electrically connected to the ground land.

1 9. The decoupling circuit of claim 7, wherein the electrical filter comprises one or more
2 lumped, distributed or dissipative elements constructed and arranged to have a frequency
3 characteristic to provide a predetermined signal filtering capability.

1 10. The decoupling circuit of claim 7, wherein the elements of the electrical filter are
2 arranged to minimize field coupling characteristics of the first receiver loop.

1 11. The decoupling circuit of claim 7, wherein the electrical filter comprises:
2 a surface-mounted capacitor mounted immediately adjacent to the interconnect post
3 and connected electrically between the interconnect post and ground land, wherein the
4 ground land is located immediately adjacent to the surface-mounted capacitor.

1 12. The decoupling circuit of claim 7, wherein the printed circuit board further
2 comprises:

3 a plurality of ground lands located immediately adjacent to and radially spaced
4 around the electrical filter components, wherein the conductive coating is electrically
5 connected to the ground lands, and wherein the conductive coating, ground plane and
6 ground lands together form a grounded compartment around the electrical filter.

1 13. A printed circuit board comprising:

2 a printed wiring board having a surface on which components are mounted;
3 an interconnect post mounted in the printed wiring board;
4 a ground plane within the printed wiring board;
5 at least one ground land connected to the ground plane;
6 an electrical filter circuit comprising one or more components mounted on the
7 printed wiring board and electrically connected to the interconnect post and a first ground
8 land; and

9 a conformal electromagnetic interference (EMI) shield adhered to surfaces of the
10 printed circuit board, comprising a dielectric coating directly contacting surfaces of the
11 one or more electrical filter components and surface traces, and a conductive coating
12 directly contacting and covering the dielectric coating and first ground land.

1 14. The printed circuit board of claim 13, wherein the electrical filter circuit is
2 constructed and arranged to shunt conducted interfering signals traveling through the
3 interconnect post to the ground plane via the first ground land.

1 15. The printed circuit board of claim 13, wherein the at least one ground land comprises
2 a plurality of ground lands radially spaced around the electrical filter circuit components,
3 wherein the conductive coating is electrically connected to each of the plurality of ground
4 lands.

1 16. The printed circuit board of claim 13, wherein the electrical filter components,
2 interconnect post, first ground land, ground plane, and interconnecting traces form a first

3 receiver loop capable of being coupled to an external field that induces an interfering
4 signal in at least one conductor of the first receiver loop.

1 17. The printed circuit board of claim 16, wherein the conductive coating, first ground
2 land, electrical filter components and interconnecting traces form a second receiver loop
3 adapted to be coupled to the external field which induces a signal in the second receiver
4 loop that cancels the induced interfering signal.

1 18. The printed circuit board of claim 13, wherein the capacitor is an element of an
2 electrical filter that also comprises one or more lumped, distributed or dissipative
3 elements.

1 19. The printed circuit board of claim 13, wherein the capacitor is located immediately
2 adjacent to the interconnect post, and the ground land to which the capacitor is connected
3 is located immediately adjacent to the capacitor.

1 20. The printed circuit board of claim 13, wherein the capacitor is a surface-mounted
2 capacitor.

1 21. A decoupling circuit on a printed circuit board, comprising:
2 an electrical filter means, electrically connected between an interconnect post and a
3 ground land coupled to a ground plane, for shunting conducted interfering signals
4 received over the interconnect post to the ground plane, wherein components of the
5 electrical filter circuit form a first receiver loop means in which interfering signals can be
6 induced; and

7 a second receiver loop means for having induced therein a signal having a direction
8 and magnitude sufficient to cancel interfering signals induced in the first receiver loop,
9 wherein said first and second receiver loop means share a conductive path.

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1 22. The decoupling circuit of claim 21, wherein said second receiver loop means
2 comprises:

3 a conductive coating of an electromagnetic interference (EMI) shield conformingly
4 adhered to surfaces of the decoupling circuit, the conductive coating being conformally

5 secured to exterior surfaces of the electrical filter means and insulated from the electrical
6 filter means, interconnect post and surface traces, and electrically connected to the ground
7 land.

1 23. The decoupling circuit of claim 21, wherein the electrical filter means comprises:
2 one or more lumped, distributed or dissipative elements constructed and arranged to
3 have a frequency characteristic to provide a predetermined signal filtering capability.

1 24. The decoupling circuit of claim 21, wherein the electrical filter means comprises:
2 a surface-mounted capacitor mounted immediately adjacent to the interconnect post
3 and connected electrically between the interconnect post and ground land, wherein the
4 ground land is located immediately adjacent to the surface-mounted capacitor.